What is claimed is:

1. A method comprising:

determining a slack value for each of one or more ready instructions based on resource constraints;

selecting one of the ready instructions, based on the slack value; and

scheduling the selected ready instruction.

2. The method of claim 1, further comprising:

performing the method set forth in claim 1 until all instructions in a scheduling region have been scheduled.

3. The method of claim 1, wherein:

determining a slack value for each of the one or more ready instructions further comprises determining the slack value for the instruction based on resource constraints and dependence height.

4. The method of claim 1, wherein determining a slack value further comprises:

determining a dependence deadline based on a dependence height for the instruction;

determining a resource deadline based on resource constraints for the instruction;

selecting between the resource deadline and the dependence deadline to choose a deadline value that indicates a least number of cycles; and

determining the slack value based on the selected deadline value.

5. The method of claim 1, wherein:

selecting one of the ready instructions further comprises selecting a ready instruction having a lowest slack value.

6. The method of claim 1, further comprising:

generating an entry in a ready list for each of the one or more ready instructions; and

removing the entry for the selected ready instruction from the ready list.

7. The method of claim 6, further comprising:

adding to an uncover list any instructions uncovered by the scheduling of the selected ready instruction.

8. The method of claim 6, further comprising:

advancing a virtual clock to a subsequent clock cycle; and

adding an entry to the ready for list for any instruction that becomes ready in the subsequent clock cycle.

9. The method of claim 1, further comprising:

determining a minimum number of cycles needed to schedule the instructions of a scheduling region, taking resource constraints into account.

10. The method of claim 9, wherein:

the minimum number of cycles is determined to be a dependence length of the scheduling region if the scheduling region is dependence-bound; and

the minimum number of cycles is determined to be a resource length of the scheduling region if the scheduling region is resource-bound.

11. The method of claim 10, further comprising:

calculating the dependence length of the scheduling region based on the total height of a dependence graph of the scheduling region; and

calculating the resource length of the scheduling region based on the maximum number of cycles needed to schedule the instructions of the scheduling region for a machine resource.

12. The method of claim 1, wherein:

the resource constraints include the maximum number of instructions of a particular instruction type that can be scheduled during a given cycle for a selected target processor.

13. An article comprising:

a storage medium having a plurality of machine accessible instructions, which if executed by a machine, cause the machine to perform the following operations:

determining a slack value for each of one or more ready instructions based on resource constraints;

selecting one of the ready instructions, based on the slack value; and

scheduling the selected ready instruction.

14. The article of claim 13, wherein:

the plurality of machine accessible instructions further include instructions, which if executed by a machine, cause the machine to perform the method set forth in claim 1 until all instructions in a scheduling region have been scheduled.

15. The article of claim 13, wherein the instructions, which if executed by a machine, cause the machine to perform determining a slack value further comprise instructions, which if executed by a machine, cause the machine to perform:

determining the slack value for the instruction based on resource constraints and dependence height.

16. The article of claim 15, wherein the instructions, which if executed by a machine, cause the machine to perform determining a slack value further comprise instructions, which if executed by a machine, cause the machine to perform:

determining a dependence deadline based on a dependence height for the instruction;

determining a resource deadline based on resource constraints for the instruction;

selecting between the resource deadline and the dependence deadline to choose a deadline value that indicates a least number of cycles; and

determining the slack value based on the selected deadline value.

17. The article of claim 13, wherein:

instructions that cause the machine to perform selecting one of the ready instructions further comprise instructions, which if executed by a machine, cause the machine to perform selecting a ready instruction having a highest scheduling priority.

18. The article of claim 13, wherein the plurality of instructions further comprise instructions, which if executed by a machine, cause the machine to perform:

generating an entry in a ready list for each of the one or more ready instructions; and

removing the entry for the selected ready instruction from the ready list.

19. The article of claim 18, wherein the plurality of instructions further comprise instructions, which if executed by a machine, cause the machine to perform:

adding to an uncover list any instructions uncovered by the scheduling of the selected ready instruction.

20. The article of claim 18, wherein the plurality of instructions further comprise instructions, which if executed by a machine, cause the machine to perform:

advancing a virtual clock to a subsequent clock cycle; and

adding an entry to the ready for list for any instruction that becomes ready in the subsequent clock cycle.

21. The article of claim 13, wherein the plurality of instructions further comprise instructions, which if executed by a machine, cause the machine to perform:

determining a minimum number of cycles needed to schedule the instructions of a scheduling region, taking resource constraints into account.

22. The article of claim 21, wherein the plurality of instructions further comprise instructions, which if executed by a machine, cause the machine to perform:

determining the minimum number of cycles to be a dependence length of the scheduling region if the scheduling region is dependence-bound; and

determining the minimum number of cycles to be a resource length of the scheduling region if the scheduling region is resource-bound.

23. The article of claim 22, wherein the plurality of instructions further comprise instructions, which if executed by a machine, cause the machine to perform:

calculating the dependence length of the scheduling region based on the total height of a dependence graph of the scheduling region; and

calculating the resource length of the scheduling region based on the maximum number of cycles needed to schedule the instructions of the scheduling region for a machine resource.

24. The article of claim 13, wherein:

the resource constraints include the maximum number of instructions of a particular instruction type that can be scheduled during a given cycle for a selected target processor.

25. A compiler comprising:

a front end; and

a code generator;

wherein the code generator includes one or more resource-aware schedulers to schedule instructions, the one or more resource-aware schedulers to take resource constraints into account to generate a slack value for each of the instructions.

26. The compiler of claim 25, wherein:

said one or more resource-aware schedulers is further to determine a first scheduling deadline for an instruction in a scheduling region, taking dependence considerations into account; and

said one or more resource-aware schedulers is further to determine a second scheduling deadline for the instruction, taking resource constraints into account; and

said one or more resource-aware schedulers is further to select between the first and second scheduling deadlines to choose a scheduling priority for the instruction.

27. The compiler of claim 25, wherein:

said resource-aware scheduler is further to select among ready instructions to select an instruction for scheduling.

28. The compiler of claim 26, wherein:

said resource-aware scheduler is further to select the instruction for scheduling based on its scheduling priority.

29. The compiler of claim 25, wherein:

said resource constraints include a maximum number of instructions that can be scheduled per cycle.

30. The compiler of claim 25, wherein:

said resource constraints include the maximum number of instructions of a particular instruction type that can be scheduled per cycle.

31. The compiler of claim 25, wherein:

the resource-aware scheduler is further to schedule the instructions such that instructions of a particular instruction type are distributed evenly among two or more resources.

32. A system comprising:

a processor; and

a memory system to store instructions;

wherein the instructions include a resource-aware scheduler to determine, based on resource constraints, a slack-based scheduling priority for each of one or more instructions.

33. The system of claim 32, wherein:

the memory system includes a DRAM.

34. The system of claim 32, wherein:

said resource-aware scheduler is further to determine a first scheduling deadline for an instruction in a scheduling region, taking dependence considerations into account; and

said resource-aware scheduler is further to determine a second scheduling deadline for the instruction, taking resource constraints into account; and

said resource-aware scheduler is further to select between the first and second scheduling deadlines to determine the scheduling priority for the instruction.

35. The system of claim 32, wherein:

said resource-aware scheduler is further to select among ready instructions to select an instruction for scheduling.

36. The system of claim 35, wherein:

said resource-aware scheduler is further to select the instruction for scheduling based on its scheduling priority.

37. The system of claim 32, wherein:

said resource constraints include a maximum number of instructions that can be scheduled per cycle.

38. The system of claim 32, wherein:

said resource constraints include the maximum number of instructions of a particular instruction type that can be scheduled per cycle.